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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,496	08/25/2003	Fred Liao	60077-0013	4227

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EXAMINER	
KOVALICK, VINCENT E	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 06/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/648,496	LIAO ET AL.	
	Examiner	Art Unit	
	Vincent E. Kovalick	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-90* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,13-15,27,30,31,34,38,39,46,49,50,58-60,72,75,76,79,83 and 84* is/are rejected.

7)☒ Claim(s) *2,3,6-12,16-26,28,29,32-33,35-37,40-45,47,48,51-57,61-71,73,74,77-78,80-82 and 85-90* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/11/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1 This Office Action is in response to Applicant's Patent Application, Serial No. 10/648,496, with a File Date of August 25, 2003.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardiner et al. (USP 6,362,818) taken with Baldwin (Pub. No. US 2002/0130863) in view of Duluk, JR. et al. (Pub. No. US 2992/0196251) and further in view of Heeschen et al. (USP 6,380,935) taken with Morein (Pub. No. 2003/0080959).

Relative to claim 1, Gardiner et al. **teaches** a system and method for reducing the rendering load for high depth complexity scenes on a computer graphics display (col. 4, lines 27-67, col. 5, lines 1-67 and col. 6, lines 1-62); Gardiner further **teaches** a graphics process mechanism comprising a mechanism for receiving information for a current primitive (col. 11, lines 9-20).

Gardiner et al. **does not teach** a mechanism for rasterizing the current primitive to a tile, wherein the tile has a corresponding buffer section for storing information pertaining to the tile; a mechanism for determining whether the tile is currently completely encompassed by a large primitive; and a mechanism for obtaining , in repose to determination that the tile is currently

completely encompassed by a large primitive, information pertaining to the tile from a local storage rather than from the corresponding buffer section, thereby reducing buffer section traffic.

Baldwin **teaches** a tile relative origin for plane equations (pg. 1, paras. 0002-0019); Baldwin further **teaches** a mechanism for rasterizing the current primitive to a tile (pg. 4, para. 0072 and pg. 8, para. 0145).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al the feature as taught by Baldwin in order to convert the graphics objects into dots for transmission to raster graphics displays.

Gardiner et al. taken with Baldwin, **does not teach** the tile has a corresponding buffer section for storing information pertaining to the tile; a mechanism for determining whether the tile is currently completely encompassed by a large primitive; and a mechanism for obtaining , in response to determination that the tile is currently completely encompassed by a large primitive, information pertaining to th tile from a local storage rather than from the corresponding buffer section, thereby reducing buffer section traffic.

Duluk Jr. et al **teaches** a method and apparatus for culling in a graphics processor with deferred shading (pg. 7/8, paras. 0090-0094); Duluk Jr. et al. further **teaches** the tile has a corresponding buffer section for storing information pertaining to the tile (pg. 13, para. 0180).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al taken with Baldwin Jr. et al. the feature as taught by Duluk Jr. et al. in order to put in place the means for making the tile related information available for processing relative to the generation of displayed images.

Gardiner et al. taken with Baldwin in view of Duluk Jr. et al. **does not teach** a mechanism for determining whether the tile is currently completely encompassed by a large primitive; and a mechanism for obtaining , in response to determination that the tile is currently completely encompassed by a large primitive, information pertaining to th tile from a local storage rather than from the corresponding buffer section, thereby reducing buffer section traffic.

Heeschen et al. **teaches** circuit and method for processing render commands in a tile-based graphics system (col. 2, lines 43-67' col. 3, lines 1-67 and col. 4, lines 1-55); Heeschen et al. further **teaches** a mechanism for determining whether the tile is currently completely encompassed by a large primitive (col. 20, lines 28-40).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al taken with Baldwin Jr. et al. in view of Duluk Jr. et al. the feature as taught by Heeschen et al. in order to reprocess the primitive and recast primitives compatible with the size of the tiles that will support the display of intended images.

Gardiner et al. taken with Baldwin in view of Duluk Jr. et al. and further in view of Heeschen et al. **does not teach** a mechanism for obtaining , in response to determination that the tile is currently completely encompassed by a large primitive, information pertaining to th tile from a local storage rather than from the corresponding buffer section, thereby reducing buffer section traffic.

Morein **teaches** a system, method and apparatus for early culling (pgs. 1&2, paras. 0011-0012); Morein further **teaches** a mechanism for obtaining , in response to determination that the tile is currently completely encompassed by a large primitive, information pertaining to th tile from a

local storage rather than from the corresponding buffer section, thereby reducing buffer section traffic (pg. 4, para. 0048).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al taken with Baldwin Jr. et al. in view of Duluk Jr. et al. and further in view of Heeschen et al. the feature as taught by Morein in order to put in place tile related data in local storage to reduce the traffic to the tile related z buffer thereby speeding up the image generation process.

4. Claim 4-5 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardiner et al taken with Baldwin Jr. et al. in view of Duluk Jr. et al. and further in view of Heeschen et al. taken with Morein as applied to claims 1 and 46 respectively in item 3 herein above, and further in view of Morein et.al.'991, (USP 6, 492,991).

Regarding claims 4-5,13-15, 49-50 and 58-60 Gardiner et al taken with Baldwin Jr. et al. in view of Duluk Jr. et al. and further in view of Heeschen et al. taken with Morein **does not teach** a graphics processing mechanism wherein the information pertaining to the tile that is obtained from the local storage comprises compressed information; or, wherein the tile comprise one or more pixels, and wherein the compressed information can be used to derive a z value for at least one of the pixels in the tile.

Morein et al.'991 **teaches** a method and apparatus for controlling compressed Z information in a video graphics system (col. 1, lines 23-67 and col. 2, lines 1-39); Morein et al.'991 further **teaches**

a graphics processing mechanism wherein the information pertaining to the tile that is obtained from the local storage comprises compressed information and wherein the tile comprise one or

more pixels, and wherein the compressed information can be used to derive a z value for at least one of the pixels in the tile; and information pertaining to the tile from the corresponding buffer section. (col. 2, lines 63-67; col. 3, lines 1-20 and Abstract).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al taken with Baldwin Jr. et al. in view of Duluk Jr. et al. and further in view of Heeschen et al. taken with Morein the feature as taught by Morein et al.'991 in order to reduce the amount of pixel related data necessary to produce the desired images; the use of the local storage to accommodate interim related pixel data reduces the traffic to the z buffer thereby speeding up the image generation process.

5. Claims 27, 30-31, 34, 38-39, 72, 75-76, 79, and 83-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardiner'125 taken with Heeschen et al. in view of Morein et al. '991.

Regarding claims 27, 34, 72 and 79 Gardiner'125 **teaches** a graphics processing mechanism comprising a mechanism for determining whether the current primitive qualifies as a large primitive (col. 10, lines 16-24) .

Gardiner et al. '125 **does not teach** a mechanism for determining whether the tile is completely encompassed by the current primitive; and a mechanism for storing , in response to a determination that the current primitive qualifies as a large primitive and the tile is completely encompassed by the current primitive, updated information pertaining to the tile in the local storage rather than the corresponding buffer section.

Heeschen et al. **teaches** a mechanism for determining whether the tile is completely encompassed by the current primitive (col. 20, lines 28-40).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al. '125 the feature as taught by Heeschen et al. in order to reprocess the primitive and recast primitives compatible with the size of the tiles that will support the display of intended images.

Gardiner et al. '125 taken with Heeschen et al. **does not teach** a mechanism for storing, in response to a determination that the current primitive qualifies as a large primitive and the tile is completely encompassed by the current primitive, updated information pertaining to the tile in the local storage rather than the corresponding buffer section.

Morein et al. '991 **teaches** a mechanism for storing, in response to a determination that the current primitive qualifies as a large primitive and the tile is completely encompassed by the current primitive, updated information pertaining to the tile in the local storage rather than the corresponding buffer section (col. 2, lines 63-67 and col. 3, lines 1-20).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide to the device as taught by Gardiner et al taken Heeschen et al. the feature as taught by Morein '991 in order to reduce the amount of pixel related data necessary to produce the desired images; the use of the local storage to accommodate interim related pixel data reduces the traffic to the z buffer thereby speeding up the image generation process.

Relative to claims 30, 31, 75 and 76, Morein et al. '991 further **teaches** the said graphics processing mechanism wherein the updated information pertaining to the tile comprises compressed information; and wherein the tile comprises one or more pixels, and wherein the compressed information can be used to drive a z value for at least one of the pixels in the tile (col. 2, lines 63-67 and col. 3, ies 1-20).

Regarding claims 38-39, 83 and 84, Morein et al.'991 further **teaches** the said graphics processing mechanism wherein the mechanism for storing updated information comprises: a mechanism for storing compressed information in the corresponding buffer section; and, wherein the tile comprises one or more pixels, and wherein the compressed information can be used to drive a z value for at test one of the pixels in the tile. (col. 2, lines 63-67 and col. 3, lines 1-20).

Allowable Subject Matter

6. Claims 2,3,6-12,16-26,28,29,32-33,35-37,40-45,47,48,51-57,61-71,73,74,77-78,80-82 and 85-90 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Relative to claim 2 and 27, the major difference between the teachings of the prior art of recored (Gardiner et al. (USP 6,362,818) ; Heeschen et al. (USP 6,380,935) and Morein et al.(USP 6,492,9910) and that of the instant invention is that said prior are of record **does not teach** the graphics processing mechanism wherein the mechanism for determining comprises a mechanism for processing a code corresponding to the tile to determine whether the code indicates that the tile is currently completely encompassed by a large primitive.

Regarding claims 6, 40, 51 and 85 the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior are of record **does not teach** the graphics processing mechanism wherein the compressed information comprises z-related information derived in accordance with delta-based z compression.

Regarding claims 10 and 55, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior are of record **does not teach** the graphics processing mechanism comprising a mechanism for determining whether the tile is in an initial state; and a mechanism for foregoing, in response to a determination that the tile is in an initial state, accessing of the corresponding buffer section.\

Regarding claims 16 , 32, 61 a d 77, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior are of record **does not teach** the graphics processing mechanism wherein the compressed information comprises z-related information derived in accordance with delta-based z compression.

Regarding claims 28 and 73, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior are of record **does not teach** the graphics processing mechanism comprising a mechanism for updating a code corresponding to the tile to indicate that the tile is completely encompasses by a large primitive.

Regarding claims 35 and 80, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior are of record **does not teach** the graphics processing mechanism wherein the tile comprises one or more pixels, and wherein the mechanism for storing comprises: a mechanism for determining whether the updated information should be stored in uncompressed format; and a mechanism for storing, in response to a determination that the updated information should be stored in uncompressed format, the update information in the corresponding buffer section in uncompressed format.

Regarding claims 45 and 90, the major difference between the teachings of the said prior art of record and that of the instant invention is that said prior are of record **does not teach** the graphics

processing mechanism wherein the current primitive corresponds to a current frame, and wherein the graphics processing mechanism further comprises; a mechanism for determining a large primitive size threshold for primitives in a subsequent frame based upon sizes of primitives in the current frame.

Conclusion

7. he prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent No.	6,580,427	Orenstein et al
U. S. Patent No.	6,473,082	Hong et al.
U. S. Patent No.	6,411,295	Hung et al.
Pub. No.	US2002/0130874	Baldwin

To Respond

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent E. Kovalick whose telephone number is 571-272-7669. The examiner can normally be reached on Monday-Thursday 7:30- 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vincent E. Kovalick
6/23/06

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